Although Waser and Ollerton appeal for scientists to take a second look at generalizations in pollination, it should be appreciated that several chapters provide strong evidence for the utility of the pollination syndrome concept (for example, Chapters 3, 12 and 14). The discussion by Corbet (Chapter 14) focuses our attention on the delimitation of pollination systems not by taxonomic grouping of pollinators but by the selective pressures that they exert on the flower, a point made recently by Fenster *et al.* [3], and also by earlier workers (e.g. Loew 1895, cited in this chapter).

The discussions of biogeographical patterns of pollination systems (Chapters 12 and 13) convincingly illustrate variations of specialized relationships between plants and pollinators across regions. To demonstrate complex plant–pollinator interactions, the authors also emphasize community studies of pollination web systems, across seasons (Chapter 11) or throughout the whole life cycle of plants (Chapter 7). Yet some other detailed studies are ignored. For example, a consecutive 53-month study involving 270 plant species in lowland dipterocarp forest demonstrated a significant association between pollinators and flower characters where pollinators were assessed by observing body contact with stigmas and anthers [4]. Thus, the objective of community studies should perhaps include insights on the evolution of floral traits. However, the caveat with these food-web approaches and all pollination studies is that actual pollinators, rather than lists of visitors should be used to describe the interactions. Some chapters (e.g. 5, 8 and 10) interweave notions of pollination specialization and generalization, exploring the utility of both, and are thus especially interesting. This is where *Plant–Pollinator Interactions* is particularly helpful.

Despite its internal heterogeneity, the focus on only a subset of pollination systems, some propensity to bias and the absence of some notable contributors, *Plant–Pollinator Interactions* is an important contribution to our understanding of plant–pollinator interactions. As Ollerton emphasizes in the last chapter, to characterize the nature of these interactions one should question their origin, maintenance and stability. By reading this book often along with the contrasting views [3], one will conclude that pollination biology is undergoing a renaissance that will ultimately provide us with a deeper understanding of the evolutionary and ecological processes involved in this fascinating interaction.

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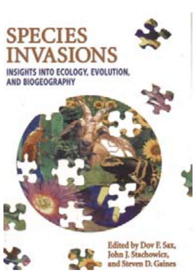
Pasteurising invasion ecology

Species Invasions: Insights into Ecology, Evolution and Biogeography edited by Dov F. Sax, John J. Stachowicz and Steven D. Gaines. Sinauer Associates, 2005. US$74.95, hbk, US$49.95 pbk (495 pages) ISBN 0 87893 811 7

W. Mark Lonsdale

CSIRO Entomology, GPO Box 1700, Canberra, ACT 2601, Australia



'Il n'existe pas de sciences appliquées, mais seulement des applications de la science' Louis Pasteur (1822–1895).

There is nothing intrinsically inferior about research that has an application: we should be trying to do the best science possible whether we are trying to fix someone's problems or to advance our understanding of the world. It is not always easy to ensure that our research will make a difference to the world while simultaneously maintaining our science impact (as measured by citation rates and so on). The subject of biological invasions should, however, be one of those where the happy confluence of conceptual and applied ecology is more achievable. Biological invasions, and our attempts to manage them, are ecological experiments on a grand scale. Solving the problem of invasions demands real creativity, while the impact they have can be vast. Take for example the 40-year series of 'planned invasions' [1] intended to convert the Australian savannas into grazing land that was more suitable for cattle, with African grasses to provide the biomass and South American legumes the nitrogen. In the process, over 400 exotic plant species were released across northern Australia, 60 of which became weeds [2].

Despite the potential for synergy, however, there has been an unfortunate disconnect between invasion

Corresponding author: Lonsdale, W.M. (mark.lonsdale@csiro.au).
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ecology and mainstream ecology [3] and, as pointed out in the final chapter of *Species Invasions*, ‘the balance of attention to invasions has been decidedly on the side of solving applied issues’. There has been an estrangement between the parent discipline and its offspring. Perhaps it is the fact that working with invasives is often so uncongenial that no one would do it by choice. In working on *Mimosa pigra* in northern Australia, I suffered all the drudgery of normal plant population biology, but with the added risk of being trampled by herds of feral water buffalo, gored by wild pigs, or accidentally shooting myself with the revolver issued by my employer in the touching belief that, during a buffalo stampede, everyone’s safety would be enhanced by having a plant ecologist blasting away indiscriminately with a side-arm.

Species Invasions attempts to reconnect the subdiscipline with the mainstream, but not with any direct applied end. It is a multi-author volume with authors mostly, but not exclusively, drawn from established and emerging ecological thinkers rather than scientists specialized on invasive species. Most are from North America (39 out of 46 authors). The book aims to ‘gain insights *about* the natural world *from* the study of biological invasions’ (my italics), and it is largely and unashamedly devoted to that goal. As an ecology text, it does tackle hot topics such as community stability, disturbance, extinction and dispersal, while largely leaving aside succession (ironically, the topic highlighted by Davis *et al.* as the key missing link between invasion and mainstream ecology [3]). Much of the book has a macroecological flavour, but it tends not to use emerging systems approaches, such as biocomplexity and earth systems science.

With its wealth of fresh ideas and approaches, *Species Invasions* will stimulate students to study invasive species. I gained a lot from reading it, and particularly enjoyed the chapters by Vermeij about invasions as a historical fact of life, by Kinlan and Hastings about geographical range expansion, and by Sax *et al.* about mechanisms limiting species diversity, a chapter that effectively asks ‘Where will it all end?’

However, there is no direct attempt to address the key challenges for dealing with invasive species, such as how to prioritise among a myriad of potential threats, the reasons why so many introduced species fail, and the causes of the typical lag phase before invader populations expand [4]. I think that this is unfortunate. It is hard to imagine medical researchers studying, for example, AIDs in Africa merely out of curiosity about the evolution and epidemiology of viruses, without attempting to treat the sick, yet *Species Invasions* does not really try to join the dots for those dealing with the management of invasive species. The editors express the hope that there will be a merging of research agendas in applied and basic science, and I share this hope, but who will make the first move?

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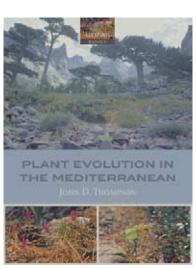
A microevolutionary perspective on Mediterranean plant evolution

Plant Evolution in the Mediterranean by John D. Thompson, Oxford University Press. £75.00/£37.50 hbk/pbk (293 pages) ISBN 0 19 851533 2/0 19 851534 0

Richard M. Cowling

Department of Botany, Nelson Mandela Metropolitan University, PO Box 77000, Port Elizabeth 6031, South Africa



For their latitude, mediterranean-climate regions harbour a disproportionately high number of plant species, especially endemics. This pattern challenges theory that predicts that richness and range restriction should peak in warm, wet and equitable climes [1]. The flora of the Mediterranean Basin, although not the most diverse among these winter-wet and summer-dry regions, is home to some 25 000 vascular plant species, 13 000 of which grow nowhere else. The endemic flora comprises many Tertiary relicts – subtropical ‘phantoms’ that predate the onset of the mediterranean climate during the mid Pliocene [3.5 million years ago (Mya)]. However, most Mediterranean Basin endemics have evolved since the inception of these climatic conditions and are thus referred to as neoendemics.

Corresponding author: Cowling, R.M. (rmc@kingsley.co.za).
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